What is claimed is:

1. A method for determining when to start additional compressors in a multiple compressor chiller system during a pull down operation of a leaving chilled liquid temperature in the multiple compressor chiller system, the method comprising the steps of:

measuring a parameter of a multiple compressor chiller system, wherein the measured parameter is related to a leaving chilled liquid temperature of the multiple compressor chiller system;

calculating a rate of change of the measured parameter of the multiple compressor chiller system;

comparing the calculated measured parameter rate of change with a predetermined rate of change for the measured parameter; and

starting an additional compressor in the multiple compressor chiller system in response to the calculated measured parameter rate of change being less than the predetermined rate of change for the measured parameter.

2. The method of claim 1 further comprising the step of repeating the steps of measuring a parameter, calculating a rate of change of the measured parameter, comparing the calculated measured parameter rate of change and starting an additional compressor until the leaving chilled liquid temperature is within a predetermined offset amount of a setpoint operating temperature for the multiple compressor chiller system.

3. The method of claim 2 wherein the predetermined offset amount is between about 1 degree and about 5 degrees.

4. The method of claim 3 wherein the predetermined offset amount is about 2 degrees.

5. The method of claim 1 further comprising before the step of starting an additional compressor in the multiple compressor chiller system, the steps of:

measuring a time period that the calculated measured parameter rate of change is less than the predetermined rate of change for the measured

parameter in response to the calculated measured parameter rate of change being less than the predetermined rate of change for the measured parameter;

comparing the measured time period to a predetermined time period; and

repeating the steps of measuring a parameter, calculating a rate of change of the measured parameter, comparing the calculated measured parameter rate of change, measuring a time period, and comparing the measured time period to a predetermined time period in response to the measured time period being less than the predetermined time period.

6. The method of claim 1 wherein the step of measuring a parameter of the multiple compressor chiller system includes the step of measuring the leaving chilled liquid temperature.

7. The method of claim 6 wherein the step of calculating a rate of change of the measured parameter includes the step of calculating a rate of change of the leaving chilled liquid temperature.

8. The method of claim 7 wherein the predetermined rate of change for the measured parameter is between about 0.5 degrees per minute and about 2 degrees per minute.

9. The method of claim 8 wherein the predetermined rate of change for the measured parameter is about 1 degree per minute.

10. The method of claim 1 wherein the measured parameter of the multiple compressor chiller system comprises one of an evaporator refrigerant temperature and an evaporator refrigerant pressure.

11. The method of claim 6 wherein the step of measuring a parameter of the multiple compressor chiller system further includes the step of calculating a difference between the measured leaving chilled liquid temperature and a setpoint operating temperature for the multiple compressor chiller system.

12. The method of claim 11 wherein the step of calculating a rate of change of the measured parameter includes the step of calculating a rate of change of the

difference between the measured leaving chilled liquid temperature and the setpoint operating temperature.

13. The method of claim 1 further comprising before the step of measuring a parameter of a multiple compressor chiller system, the steps of:

starting at least one compressor of the multiple compressor chiller system; and

determining that the at least one compressor is in a normal loaded operating state.

14. The method of claim 13 wherein the step of determining that the at least one compressor is in a normal loaded operating state includes the steps of:

measuring an elapsed time period from the start of the at least one compressor; and

comparing the elapsed time period to a predetermined time period, wherein the elapsed time period being greater than the predetermined time period is indicative that the at least one compressor is in a normal loaded operating state.

15. The method of claim 13 wherein the step of determining that the at least one compressor is in a normal loaded operating state includes the steps of:

measuring a pre-rotation vane position for the at least one compressor; and

comparing the measured pre-rotation vane position to a predetermined pre-rotation vane position, wherein the measured pre-rotation vane position being substantially equal to or more open than the predetermined pre-rotation vane position is indicative that the at least one compressor is in a normal loaded operating state.

16. The method of claim 13 wherein the step of determining that the at least one compressor is in a normal loaded operating state includes the steps of:

measuring a motor current for the at least one compressor; and

comparing the measured motor current to a predetermined threshold motor current, wherein the measured motor current being substantially equal to or greater than the predetermined threshold motor current is

indicative that the at least one compressor is in a normal loaded operating state.

17. A computer program product embodied on a computer readable medium and executable by a microprocessor for determining when to start additional compressors in a multiple compressor chiller system during a pull down operation of a leaving chilled liquid temperature in the multiple compressor chiller system, the computer program product comprising computer instructions for executing the steps of:

measuring a parameter of a multiple compressor chiller system, wherein the measured parameter is related to a leaving chilled liquid temperature of the multiple compressor chiller system;

determining a rate of change of the measured parameter of the multiple compressor chiller system;

comparing the determined measured parameter rate of change with a predetermined rate of change for the measured parameter; and

starting an additional compressor in the multiple compressor chiller system in response to the determined measured parameter rate of change being less than the predetermined rate of change for the measured parameter.

18. The computer program product of claim 17 further comprising computer instructions for executing the step of repeating the steps of measuring a parameter, determining a rate of change of the measured parameter, comparing the determined measured parameter rate of change and starting an additional compressor until the leaving chilled liquid temperature is within a predetermined offset amount of a setpoint operating temperature for the multiple compressor chiller system.

19. The computer program product of claim 18 wherein the predetermined offset amount is between about 1 degree and about 5 degrees.

20. The computer program product of claim 19 wherein the predetermined offset amount is about 2 degrees.

21. The computer program product of claim 17 further comprising computer instructions for executing before the step of starting an additional compressor in the multiple compressor chiller system, the steps of:

measuring a time period that the determined measured parameter rate of change is less than the predetermined rate of change for the measured parameter in response to the determined measured parameter rate of change being less than the predetermined rate of change for the measured parameter;

comparing the measured time period to a predetermined time period; and

repeating the steps of measuring a parameter, determining a rate of change of the measured parameter, comparing the determined measured parameter rate of change, measuring a time period, and comparing the measured time period to a predetermined time period in response to the measured time period being less than the predetermined time period.

22. The computer program product of claim 17 wherein the step of measuring a parameter of the multiple compressor chiller system includes the step of measuring the leaving chilled liquid temperature.

23. The computer program product of claim 22 wherein the step of determining a rate of change of the measured parameter includes the step of determining a rate of change of the leaving chilled liquid temperature.

24. The computer program product of claim 23 wherein the predetermined rate of change for the measured parameter is between about 0.5 degrees per minute and about 2 degrees per minute.

25. The computer program product of claim 24 wherein the predetermined rate of change for the measured parameter is about 1 degree per minute.

26. The computer program product of claim 22 wherein the step of measuring a parameter of the multiple compressor chiller system further includes the step of calculating a difference between the measured leaving chilled liquid temperature and a setpoint operating temperature for the multiple compressor chiller system.

27. The computer program product of claim 26 wherein the step of determining a rate of change of the measured parameter includes the step of determining a rate of change of the difference between the measured leaving chilled liquid temperature and the setpoint operating temperature.

28. The computer program product of claim 17 wherein the measured parameter of the multiple compressor chiller system comprises one of an evaporator refrigerant temperature and an evaporator refrigerant pressure.

29. The computer program product of claim 17 further comprising computer instructions for executing before the step of measuring a parameter of a multiple compressor chiller system, the steps of:

starting at least one compressor of the multiple compressor chiller system; and

determining that the at least one compressor is in a normal loaded operating state.

30. The computer program product of claim 29 wherein the step of determining that the at least one compressor is in a normal loaded operating state includes the steps of:

measuring an elapsed time period from the start of the at least one compressor; and

comparing the elapsed time period to a predetermined time period, wherein the elapsed time period being greater than the predetermined time period is indicative that the at least one compressor is in a normal loaded operating state.

31. The computer program product of claim 29 wherein the step of determining that the at least one compressor is in a normal loaded operating state includes the steps of:

measuring a pre-rotation vane position for the at least one compressor; and

comparing the measured pre-rotation vane position to a predetermined pre-rotation vane position, wherein the measured pre-rotation vane position being substantially equal to or more open than the

predetermined pre-rotation vane position is indicative that the at least one compressor is in a normal loaded operating state.

32. The computer program product of claim 29 wherein the step of determining that the at least one compressor is in a normal loaded operating state includes the steps of:

measuring a motor current for the at least one compressor; and

comparing the measured motor current to a predetermined threshold motor current, wherein the measured motor current being substantially equal to or greater than the predetermined threshold motor current is indicative that the at least one compressor is in a normal loaded operating state.

33. A method for controlling a pull down operation of a secondary liquid leaving an evaporator in a multiple compressor refrigeration system from an elevated temperature to a setpoint temperature, the method comprising the steps of:

operating a predetermined number of compressors in a multiple compressor refrigeration system in response to a temperature of a secondary liquid leaving an evaporator in the multiple compressor system being above a setpoint temperature, wherein the operation of the predetermined number of compressors pulls down the temperature of the secondary liquid leaving the evaporator toward the setpoint temperature;

measuring a parameter of the multiple compressor refrigeration system, wherein the measured parameter is related to the temperature of the secondary liquid leaving the evaporator;

determining a rate of change of the measured parameter of the multiple compressor refrigeration system;

comparing the determined measured parameter rate of change with a predetermined rate of change for the measured parameter; and

operating an additional compressor in the multiple compressor refrigeration system in response to the determined measured parameter rate of change being less than the predetermined rate of change for the measured parameter, wherein the operation of the additional compressor

assists the predetermined number of compressors in pulling down the temperature of the secondary liquid leaving the evaporator toward the setpoint temperature.

34. The method of claim 33 further comprising the step of repeating the steps of operating a predetermined number of compressors, measuring a parameter, determining a rate of change of the measured parameter, comparing the determined measured parameter rate of change and operating an additional compressor until the temperature of the secondary liquid leaving the evaporator is within a predetermined offset amount of the setpoint temperature.

35. The method of claim 34 wherein the predetermined offset amount is between about 1 degree and about 5 degrees.

36. The method of claim 35 wherein the predetermined offset amount is about 2 degrees.

37. The method of claim 33 further comprising before the step of operating an additional compressor in a multiple compressor refrigeration system, the steps of:

determining an operating state for the predetermined number of compressors; and

repeating the step of determining an operating state for the predetermined number of compressors until the predetermined number of compressors are determined to be in a normal loaded operating state.

38. The method of claim 37 wherein the step of determining an operating state for the predetermined number of compressors includes the steps of:

measuring an elapsed time period from the step of operating of the predetermined number of compressors; and

comparing the elapsed time period to a predetermined time period, wherein the elapsed time period being greater than the predetermined time period being indicative of the predetermined number of compressors being in a normal loaded operating state.

39. The method of claim 37 wherein the step of determining an operating state for the predetermined number of compressors includes the steps of:

measuring a pre-rotation vane position for the predetermined number of compressors; and

comparing the measured pre-rotation vane position to a predetermined pre-rotation vane position, wherein the measured pre-rotation vane position being substantially equal to or more open than the predetermined pre-rotation vane position being indicative of the predetermined number of compressors being in a normal loaded operating state.

40. The method of claim 37 wherein the step of determining an operating state for the predetermined number of compressors includes the steps of:

measuring a motor current for the predetermined number of compressors; and

comparing the measured motor current to a predetermined threshold motor current, wherein the measured motor current being substantially equal to or greater than the predetermined threshold motor current being indicative of the predetermined number of compressors being in a normal loaded operating state.

41. The method of claim 33 further comprising before the step of operating an additional compressor in a multiple compressor refrigeration system, the steps of:

measuring an elapsed time period from the step of comparing the determined measured parameter rate of change with a predetermined rate of change for the measured parameter in response to the determined measured parameter rate of change being less than the predetermined rate of change for the measured parameter;

comparing the measured elapsed time period to a predetermined time period; and

repeating the steps of measuring a parameter, determining a rate of change of the measured parameter, comparing the determined measured parameter rate of change, measuring an elapsed time period, and comparing the measured elapsed time period to a predetermined time

period in response to the measured elapsed time period being less than the predetermined time period.

42. The method of claim 33 wherein step of measuring a parameter of the multiple compressor system includes the step of measuring a temperature of the secondary liquid leaving the evaporator.

43. The method of claim 42 wherein the step of measuring a parameter of the multiple compressor system further includes the step of calculating a difference between the measured temperature of the secondary liquid leaving the evaporator and the setpoint temperature.

44. The method of claim 43 wherein the predetermined rate of change for the measured parameter is between about 0.5 degrees per minute and about 2 degrees per minute.

45. The method of claim 44 wherein the predetermined rate of change for the measured parameter is about 1 degree per minute.

46. The method of claim 33 wherein the step of measuring a parameter of the multiple compressor system includes the step of measuring a refrigerant temperature in the evaporator.

47. The method of claim 33 wherein the step of measuring a parameter of the multiple compressor system includes the step of measuring a refrigerant pressure in the evaporator.